PDR RID Report

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Category Name Design-Ingest
Actionee HAIS
Sub Category
Subject Ingest Client Host Sizing

Description of Problem or Suggestion:

The TRMM Release Ingest Client Host HWCI is a single, workstation class server with a backup. The data rate that must be supported for TSDIS is 13.7 GBytes per day: about 1.3 Mbits/s sustained transfer rate across 24 hours or 7.8 Mbits/s for a four hour transfer. PACOR did benchmarks two years ago for disk to disk file transfer across a FDDI LAN achieving at most 4 Mbits/s with Sun workstation servers with 1 MByte/s disk transfer rates. The throughput limitation was the disk rate in that case. The TRMM Release design may be borderline acceptable subject to the dynamics of the TSDIS ingest file interarrival time (i.e., the TSDIS files may be streamed over a short period of time). Also, there is a claim that the host has been sized to support preprocessing of ingest data. This is not considered in the system simulation model; therefore, the analysis had to have been static. The design also has implications for software design, RMA, and interface specifications even if a single Ingest Client Host can meet the TRMM Release throughput requirements. For the AM-1 Release, a single host will probably not be sufficient (even one upgraded with faster/more CPUs since the disk rate is probably the bottleneck). Using multiple hosts (stated as a possible migration path in the SDPS design specification) for ingest would require TSDIS, EDDIES, and other ingest sources to know which hosts to contact and would require more backup hosts for redundancy, which will increase cost.

Originator's Recommendation

IV&V recommends that HAIS:

1) examine the Ingest Client Host design for the TRMM Release requirements using an enhanced system simulation model that represents the processing and disk delays;
2) examine the migration strategy for the AM-1 Release and beyond using the same model modified as necessary to represent the design alternatives; and
3) determine the impact of the design migration required to meet the throughput requirements on the software design, resulting availability characteristics, and the external interface impacts.

GSFC Response by:
GSFC Response Date

HAIS Response by: Eisenstein
HAIS Schedule
HAIS R. E. P. Roycraft
HAIS Response Date 5/3/95

System resources required for the ingest of TRMM products (both from TSDIS and SDPF) are included in the sizing estimates for either the Data Server Subsystem or Ingest Subsystem depending on the level of the ingested data. The Ingest Subsystem provides the Ingest Client software that manages all aspects of the data transfer between an outside data source and ECS. This software may run on hardware located in either the Ingest Subsystem or Data Server Subsystem. The ingest of data through the Ingest client host hardware is generally limited to those cases requiring the higher RMA provided by the Ingest Subsystem configuration (e.g., EDOS and SDPF data ingest), those that require significant pre-processing, and all Level 0 data which is to be stored within the Ingest rolling storage. All data not meeting these criteria are planned to be ingested (using ingest client s/w) directly into the Data Server Access/Process Coordinator (APC) CPUs onto connected working storage space.

In particular, the TSDIS data sets identified for ingest into ECS in the Release A timeframe will be ingested directly into the Data Server Subsystem through the APCs, onto working storage, and into the data server repository. No Ingest client host hardware is involved in the TSDIS data transfer.

Therefore, the Data Server Subsystem design documented in ECS doc. 305-CD-002-002 is sized to accommodate the planned number of TSDIS data sets and data set volume to be ingested in the Release A timeframe. The sizing accomplished prior to PDR was a static analysis based on the data product information contained in the ECS Technical Baseline. Further sizing efforts in preparation for the Release A CDR will include data analysis from several working groups, as well as user and data modeling efforts depicting inter and intra subsystem loads (including delays resulting from disk accesses and processing).

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We note that ECS plans to use RAID-based devices, which offer the potential for significantly better performance characteristics than those obtained in the experiment cited in the RID. Prototypes are also planned to be developed in the ECS Development Facility (EDF) that will investigate aspects of Ingest and Data Server Subsystem performance, including staging disk and network (FDDI) performance, to verify our expectations. These efforts will continue into the Release B (AM-1) timeframe. We are aware of the challenges presented in terms of average data rate and volume in the Release B timeframe, and a significant component of the Release B design effort will be to develop strategies to mitigate the impact of the transition from Release A operations to Release B.

Status **Closed** **Date Closed** **7/6/95** **Sponsor** **Kobler**

****** **Attachment if any** ******